



DICHOTOMOUS KEY

TIME & AUDIENCE LEVEL

- 6th-8th Grade
- 20-25 minutes

VOCABULARY

Kemp's Ridley sea turtle
Loggerhead sea turtle
Green sea turtle
Dichotomous Key
Rhamphotheca
Plastron
Scute
Terminal Scute

MATERIALS

- Kemp's Ridley fact sheet
- Loggerhead fact sheet
- Green Sea Turtle fact sheet
- Dichotomous key activity page

CRITICAL THINKING QUESTIONS

Compare and contrast species adaptations that aid in the ability to survive in different aquatic environments.

What are human impacts that affect sea turtles and what are ways you can lessen these impacts?

SUMMARY

Each species of sea turtle has its own unique characteristics. Through the use of a dichotomous key, students will learn how to identify three of the most common sea turtle patients at the Georgia Sea Turtle Center.

OBJECTIVES

- Students will familiarize themselves with the three most common sea turtle patients at the Georgia Sea Turtle Center.
- Students will learn specific sea turtle anatomy.
- Students will practice using a dichotomous key and identifying different sea turtle species.

GENERAL INFORMATION

All sea turtles are ectothermic marine reptiles with shells, scales, beaks and flippers. However, there are many behavioral and structural differences between the species. Students will figure out the differences between the three most common species that come to the Georgia Sea Turtle Center by identifying sea turtles using a dichotomous key.

The concept for a **dichotomous key** was invented by Richard Wallers in 1689. The first key was used to identify herbs of Britain. Since then, we have used dichotomous keys to identify many organisms we find in nature that may be closely related and hard to differentiate between. The key gives you choices, and if followed correctly, it will lead you to the name of the organism you are trying to identify.

This activity uses a "branching" key to identify the three most common sea turtle species treated at the Georgia Sea Turtle Center. This means that the characteristics of the organisms are laid out similar to a flow chart. Starting at the very top and following the chart according to the characteristics present, you arrive at the correct name for that organism. The key will use physical characteristics like **rhamphothecas**, keratin layer of the beak, and **plastrons**, the bottom shell to identify each species. **Scutes** are modified scales made of keratin that cover the bone of the shell. We will be using the **terminal scute**, the scute found at the end of the plastron, to differentiate between our turtles.

GEORGIA SCIENCE STANDARDS OF EXCELLENCE

L6-8RH4: Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

S7L1: Obtain, evaluate, & communicate information to investigate the diversity of living organisms and how they can be compared scientifically.

CONTENT RESOURCES

Gibbons, Whit. (2017, Aug 29). Reptiles and Amphibians. Retrieved from <http://www.georgiaencyclopedia.org/articles/geography-environment/reptiles-and-amphibians>.

Gulko, David and Eckert, Karen. (2004). *Sea Turtles: An Ecological Guide*. Mutual Publishing, Honolulu, HI.

Witherington B. and Witherington D. (2015). *Our Sea Turtles: a Practical Guide for the Atlantic and Gulf, from Canada to Mexico*. Sarasota, FL: Pineapple.

Griffing LR, Biology Department (2011). Who invented the dichotomous key? Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/22074776>

Editors, B. D. (2019, October 5). Dichotomous Key. Retrieved from <https://biologydictionary.net/dichotomous-key>

GEORGIA SEA TURTLE CENTER CONTACT INFORMATION

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The **Kemp's Ridley** sea turtle (*Lepidochelys kempii*) is the smallest of the seven species, reaching a maximum weight of 80-100 lbs and two feet in length. Their **carapace** is dull gray in color and almost completely circular in shape. This helps them camouflage in muddy and sandy-bottomed areas that are rich in crabs and mollusks, a primary food source for the Kemp's Ridley.



The **Loggerhead** sea turtle (*Caretta caretta*) is the most common species of sea turtle found along the Georgia coast. Their orange/red carapace and yellow scales camouflage well in the area's productive waters. Named for its large head and crushing jaws, Loggerheads

can reach a weight of 200-400 lbs, grow to be about 4 ft in length and feast primarily on animals with a hard shell. Blue crabs, horseshoe crabs and whelks (a species of sea snail) are easy prey for the Loggerhead.

The **Green** sea turtle, (*Chelonia mydas*) as its name suggests, is almost strictly vegetarian once it reaches adulthood.

They feast on a variety of seafood, seagrass and algae as juveniles, but transition to a plant-based diet at three to five years of age. Their beak is specifically designed with a serrated

edge for nipping and tearing seagrass, and may look like small teeth to an untrained eye. The individual scute pattern resembles that of a sunburst, helping the Green camouflage in seagrass beds. Green sea turtles are the largest of the hard-shelled sea turtles and can grow to be 300-500 lbs and grow to about 5 ft in length.



SET UP

Provide the student with one sea turtle fact sheet, sea turtle anatomy sheet and the dichotomous key.

INTRODUCTION

We will be focusing on beaks, plastrons, and scutes to identify these turtles. The species sheets will have pictures and information about each of these attributes on the sea turtle to help the student identify what species it is. Be sure to go over the vocabulary words on the Sea Turtle Anatomy Sheet. Take a look at the diagram on the sheet as well.

The terminal scute is identified by an arrow to show where it is found on the plastron. Ask the student which turtle diagram has the terminal scute and which one does not. The sea turtle fact sheets are identified by numbers 1, 2 and 3. They contain details about the turtle species, as well as photos to further help identify them. The correct species name will be located in the lower right hand corner in an Answer Key.

ACTIVITY PROCEDURES

1. Allow the student to choose the sea turtle they want to identify from the three species sheets.
2. Give them the dichotomous key and the Sea Turtle Anatomy sheet.
3. Grant the student about 5 minutes to use the Sea Turtle Species sheet, Sea Turtle Anatomy sheet, and dichotomous key to correctly identify their turtle.

These are the correct steps to follow in the key for each species:

Loggerhead (#1)

1. Sea Turtle
2. No serrations on beak
3. There is NOT a small terminal scute on the plastron
4. Loggerhead (*Caretta caretta*)

Green Sea Turtle (#2)

1. Sea Turtle
2. Serrations on Beak
3. Green Sea Turtle (*Chelonia mydas*)

Kemp's Ridley Sea Turtle (#3)

1. Sea Turtle
2. No serrations on beak
3. There is a small terminal scute on the plastron
4. Kemp's Ridley (*Lepidochelys kempii*)

WRAP UP/CONSERVATION MESSAGE

Once the student has correctly identified their sea turtle, ask them to tell you what other differences they might notice that make them different than the other sea turtle species.

Do they notice any differing colors between the turtles? Different patterns on their shell? Do they think they can guess where they might live in the ocean based on their colors?

All of our turtle's have beaks, regardless of what shape beak they have all of these turtles can still ingest plastics found in our the oceans. Some things we can do in our everyday lives to help all of our sea turtle species is to reduce, reuse and recycle.

You can continue the activity with the two remaining sea turtle species sheets.





SEA TURTLE SPECIES SHEET #1



Scientific Name: *Caretta caretta*

Head: Very large and wide head

Beak: Shaped like a flat crushing plate

Diet: Carnivorous; feasting mainly on hard-shelled animals such as blue crabs, whelks and horseshoe crabs

Color: Light brown to orange

Shell: Heart-shaped / shield-shaped

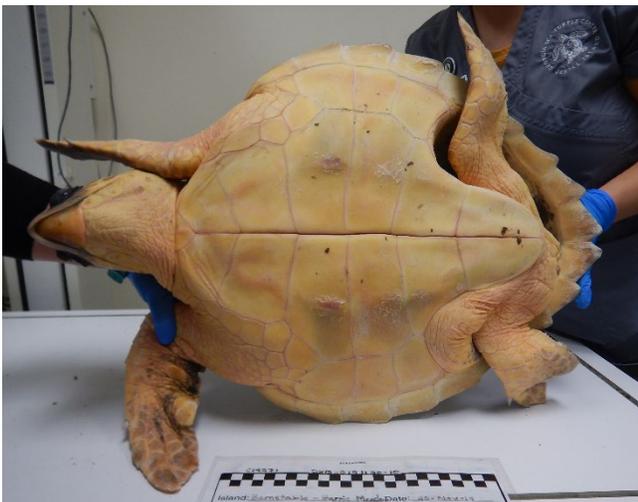


Fig. 1 View of plastron



Fig. 2 Skull and beak

Answer: Loggerhead



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SEA TURTLE SPECIES SHEET #2



Scientific Name: *Chelonia mydas*

Head: Small head compared to their body size

Beak: Serrated edges

Diet: Herbivorous; seagrasses and algae

Color: Brown shell with white/brown/green skin

Shell: Sunburst pattern to help them camouflage within the seagrass beds



Fig. 1 View of plastron



Fig. 2 Skull and beak

Answer: Green Sea Turtle

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SEA TURTLE SPECIES SHEET #3



Scientific Name: *Lepidochelys kempii*

Head: Head size is very proportional to body size

Beak: Hooked beak

Diet: Carnivorous; crabs, mollusks, squid and fish

Color: Light-Dark Grey

Shell: Rounded shells, roughly as long as they are wide



Fig. 1 View of plastron



Fig. 2 Skull and beak

Answer: Kemp's Ridley

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SEA TURTLE ANATOMY

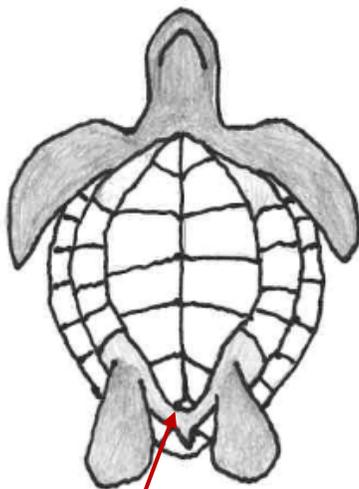


Scutes: Modified scales made of keratin, covering the bone of the shell

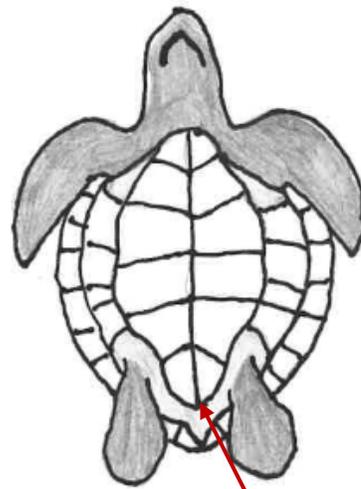
Carapace: The top shell

Plastron: The bottom shell

Terminal: End



Sea Turtle plastron with a terminal scute.



Sea Turtle plastron WITHOUT a terminal scute.





SEA TURTLE DICHOTOMOUS KEY

